

Convergence Anatomization of Aquaculture Production in Leading Fish-Producing Countries During the Period of 1997-2013

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ABSTRACT

Growth and national importance of aquaculture production is empirically assessed as an important indicator of development. The present article aims to test whether the major aquaculture producing countries of the world are converging over time. The authors have applied the absolute and conditional beta convergence and sigma convergence approaches on the data of FAO for the period 1997-2013. The results show that there is an absolute beta convergence and sigma convergence among 25 major aquaculture producing countries; negative sign of coefficient of conditional beta convergence with per capita income is also noticed. It implies, the growth rates of aquaculture for developed nations are declining with rise in per capita income and backward fish-intensive countries are catching up with the giant producers like China and India. The cross-country variations are also going down which means that the countries' development gaps are getting narrowed by means of growth of aquaculture resources.

KEYWORDS

Aquaculture Production, Beta Convergence, Crustaceans, Development, Fish, Growth, Molluscs, Sigma Convergence

INTRODUCTION

The dynamic scenario of the increasing or decreasing gap between rich and poor countries in terms of availability or production of any commodity, catching-up or deviation from catching-up effect, is discernable by convergence analysis - rising or falling gap leads us to grasp whether inequality across the countries rises or vice versa. In Economic Science, the convergence analysis, as the existing literatures show, is done mostly for the economic indicators like gross domestic product in total or per capita terms, capital formation, households' consumption expenditure, carbon emissions, life expectancy, education infrastructures, green indicators (Barro 1991; Wolff 1991; Mankiw et al 1992; Quah 1993; Boyale & McCarthy 1997; Ghosh et al 1998; Barro & Sala-i-Martin 2004; Borkowski et al 2008; Nayyar 2008; Kumar 2008; Das 2013; Domazet et al 2012; Piketty 2014; Ray et al 2016; Das et al 2016) among others; however, the analysis of the same issue in light with production of aquaculture is hard to find as empirical evidences among the countries or regions of the world. The present paper has, thus, taken up this issue for cross country convergence anatomization.

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Fish industry generates outputs in almost all the countries depending on availability of water resources in different forms like inland water, saline water, brackish water and its growth rates over time cannot be denied in view of catching-up effect, despite the fact that aquatic element like fish occupies very small space in the domain of agriculture in developed nations in particular. In contrast, fish and allied products are assumed to be major items in developing nations so far as volume of economic activities in terms of value additions to national output are concerned. Decomposition of entire agricultural income of developed and developing nations could explore the relative importance of income generated from fish and aquatic species. In the present context fish and aquatic species are considered as major output in the developing nations so far as absolute annual production is concerned which is not true for the so called developed nations. In absolute terms, primary observation reveals that the so called industrially developed nations, on an average, are poor in producing fish output compared to global share whereas developing nations contributing considerable amount to their gross domestic products (GDP) accounts so far as global fish output is concerned.

During the last 50 years, the shares of agricultural incomes including fish farming to GDP in most of the countries, on an average, have been declining since both GDP and absolute income from agriculture sector have got uptrend over time. This sort of growth pattern over time is perhaps explained by excessive stress in expansion of industrial sector; service sector too as a resultant in almost all the continents. In India, the margin between the cost of cultivation per acre and corresponding revenue becomes shallow in some places over the time; even small and marginal farmers at the drought-prone village level are often compelled to leave the agricultural occupation and hence change in occupation like a vagabond is pronounced today. But scenario is quite different in case of fish farming; it is highly remunerative activities due to strong market demand for this kind of protein-based food and naturally suited environments to the world's major fish producing countries. Though, it is dependent on natural endowment of availability of sweet water, if we do not consider the ocean water to the concerned nation. Fish farming has become one of the highly remunerative and fast growing economic activities, despite the market-oriented hindrances of processing, packaging, transporting, storing etc.; it is supposed to be best alternative to traditional agricultural practices based on seasonal rainfall as far as study of FAO (2008) is concerned. According to Mwangi (2008) fisheries activities create a massive spillover effect to the national economy through employment creation, foreign exchange earnings, poverty reduction and food security support; it contributes about 0.5 per cent to GDP in the year 2006 in Kenya. The contribution to GDP could have been relatively high if value addition at various stages of supply chain is considered with the minimization of post-harvest losses. The study of Ngugi et al (2007) explore the prosperity of fish-farming in Kenya as the country is being endowed with numerous aquatic resources, both geographical and climatic factors matter immensely in favor of generating fish output that influences GDP directly.

So, it does not require any more empirical evidences to mention that the rate of return in the market or profitability is relatively high in fishing and aquatic elements compared to many other agricultural economic activities. Despite the high market incentives in fishing activities etc., this branch of agriculture or agribusiness is highly neglected in a large number of developing countries. Asian and Latin American countries in overall sense perform a very significant role in fish cultivation at the world level, since proportion of agricultural income to GDP as well as fish to agriculture is high compared to developed nations. Therefore, the development of the aquaculture requires special emphasis in the national development discourses in Asian and Latin American economies. Enhancement of per capita consumption of protein and hence the nutritional standard / food security in the poor countries of these regions is highly relevant today. Generation of employment in rural sector via expansion of fisheries activities would obviously reduce the poverty since about 30-40 per cent of rural population is lying below poverty line in Asia and 10-20 per cent in Latin America (World Bank data on Poverty and Equity 2012). The ever-bourgeoning demand for fish, rising trend of prices and development of biotechnology have contributed to the horizontal and vertical expansion of aquaculture all over the world. Technological and scientific aspects of aquaculture, farming practices, resource potential,

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